File NR G2-29085

State of Washington
REPORT OF EXAMINATION
FOR WATER RIGHT APPLICATION

PRIORITY DATE
January 10, 1994

WATER RIGHT NUMBER
G2-29085

MAILING ADDRESS
City of Yelm
Shelly Badger, City Administrator
105 Yelm Avenue W.
Yelm, Washington 98597

SITE ADDRESS (IF DIFFERENT)

Quantity Authorized for Withdrawal or Diversion

WITHDRAWAL OR DIVERSION RATE	UNITS	ANNUAL QUANTITY (AF/YR)
2100	GPM	942

Purpose

	WITHDRAWAL OR DIVERSION RATE			ANNUAL QUANTITY (AF/YR)		
PURPOSE	ADDITIVE	NON-ADDITIVE	UNITS	ADDITIVE	NON-ADDITIVE	PERIOD OF USE (mm/dd)
Municipal Supply	2100		GPM	942		Year round

IRRIGATED ACRES		PUBLIC WATER SYSTEM INFORMATION	
ADDITIVE	NON-ADDITIVE	WATER SYSTEM ID	CONNECTIONS
		99350	

Source Location

COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA
Thurston	TQu Aquifer		11 – Nisqually

SOURCE FACILITY/DEVICE	PARCEL	WELL TAG	TWN	RNG	SEC	QQ Q	LATITUDE	LONGITUDE
SW Well 1A	78640000024	ALM 113	17N	01E	23	SE SE	46.94525 N	-122.64347 E

Place of Use (See Attached Map)

LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE

The place of use (POU) of this water right is the service area described in the most recent Water System Plan approved by the Washington State Department of Health, so long as the water system is and remains in compliance with the criteria in RCW 90.03.386(2). Under RCW 90.03.386, future changes to the POU for this water right may occur.

Proposed Works

The SW Well 1A was completed to a depth of 633 feet below ground surface (bgs) with a 12-inch diameter casing from +2 to 367.5 feet bgs and an 8-inch diameter casing and well screen assembly from 349 to 633 feet bgs.

Development Schedule

BEGIN PROJECT	COMPLETE PROJECT	PUT WATER TO FULL USE
Begun	June 1, 2016	June 1, 2031

Measurement of Water Use

How often must water use be measured?	Weekly
How often must water use data be reported to Ecology?	Annually (Jan 31)
What volume should be reported?	Total Annual Volume & Report-Volume
What rate should be reported?	Weekly Peak Rate of Withdrawal (gpm)

Provisions

Mitigation

The use of water under this permit is subject to the fulfillment of the City of Yelm Water Rights Mitigation Plan, February 2011 Update, as presented by Yelm (2011) ("Mitigation Plan") and as amended below, and continued agreement between the cities of Olympia, Lacey, and Yelm through the supporting Amended Interlocal Agreement

A joint Mitigation Summary Report shall be prepared by the City and submitted to Ecology annually. At a minimum, the report shall include:

- Development and performance of the previous year's basin-specific (Woodland Creek, McAllister Creek, Nisqually River, and Deschutes River) out-of-kind mitigation actions. The section on the Deschutes River and Woodland Creek shall be jointly developed with the cities of Lacey and Olympia consistent with interlocal agreements between the cities;
- Development and performance of the previous year's basin-specific in-kind mitigation actions. The summary of performance shall be supported by available data;
- Completed city-specific mitigation actions by basin;
- Applicable water right permit development, by phase (1, 2, and 3);
- Comparison between permit development and corresponding completed mitigation actions; and
- Identification of mitigation actions not completed, if any, including a revised schedule and proposed limitations on permit development until completed.

For brevity, the summary report may include appendices of construction and monitoring reports. The annual Mitigation Summary Report for the previous year is due to Ecology on January 31. The first summary report is due on January 31, 2013.

Signed at Olympia, Washington, this 21st day of October 2011.

Michael J. Gallagher

Michael J. Gallagher, Section Manager

For additional information visit the Environmental Hearings Office Website: http://www.eho.wa.gov. To find laws and agency rules visit the Washington State Legislature Website: http://www1.leg.wa.gov/CodeReviser.

Your Right To Appeal

You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of the Order.

File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.

- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.
- You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Mailing Addresses	Street Addresses
Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903 **Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608	**Pollution Control Hearings Board** 1111 Israel RD SW Ste 301 Tumwater, WA 98501 **Department of Ecology** Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503

The third unnamed water right referenced under the Mitigation Plan in the Deschutes Basin is not a required mitigation element under this water right approval.

Measurements, Monitoring, Metering and Reporting
An approved measuring device must be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173, which describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition the Department of Ecology for modifications to some of the requirements.

Water use shall be recorded weekly. Recorded water use data may be submitted via the Internet. To set up an Internet reporting account, contact the Southwest Regional Office. If you do not have Internet access, you can still submit hard copies by contacting the Southwest Regional Office for forms to submit your water use data.

WAC 173-173 describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition the Department of Ecology for modifications to some of the requirements.

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the project location, and to inspect at reasonable times, records of water use, wells, diversions, measuring devices and associated distribution systems for compliance with water law.

Water Level Measurements
Static water levels shall be measured and recorded monthly, using a consistent methodology. Data for the previous year shall be submitted by January 31 to the Department of Ecology.

Proof of Appropriation
The water right holder shall file the notice of Proof of Appropriation of water when the permanent distribution system has been constructed and the quantity of water required by the project has been put to full beneficial use. The certificate will reflect the extent of the project perfected within the limitations of the permit. Elements of a proof inspection may include, as appropriate, the source(s), system instantaneous capacity, beneficial use(s), annual quantity, place of use, and satisfaction of provisions.

Findings of Facts
Upon reviewing the investigator's report, I find all facts, relevant and material to the subject application, have been thoroughly investigated.

Therefore, I ORDER approval of Application No. G2-29085, subject to existing rights and the provisions specified above.

INVESTIGATOR'S REPORT
Application for Water Right -- Yelm City
Water Right Control Number G2-29085
Michael J. Gallagher, Department of Ecology

BACKGROUND

Description and Purpose of Proposed Application

On January 10, 1994, Yelm filed an Application for a Water Right (G2-29085) for a permit to appropriate public groundwater for municipal supply purposes. Yelm requested authorization for an instantaneous withdrawal rate (Qi) of 3000 gallons per minute (gpm) and a total annual withdrawal volume (Qa) of 3,500 acre-feet per year (afy). This application was later modified in Yelm's February 2011 Water Rights Mitigation Plan to a Qi of 2100 gpm and a Qa of 942 afy[1].

Yelm's water system consists of water withdrawal, conveyance, and treatment facilities. Currently, Yelm's municipal water is supplied by two relatively shallow wells (Wells, 1A and 2), which are located in downtown Yelm.

In January 2010, Yelm applied and received a preliminary permit to drill and test a well to explore the potential of developing new groundwater sources from a portion of the aquifer system that would lessen the effects of pumping on nearby local Yelm area surface water features. Developing a groundwater supply from deeper parts of the aquifer system in the Yelm area would allow Yelm to meet its increasing demands for water supply while minimizing the impacts of these withdrawals. Well construction began in April 2010 and testing was completed in October 2010. This new well is completed to a depth of 633 feet below ground surface (bgs) and is screened with three 35-slot screens located in water bearing zones of 369-437 feet bgs, 487-547 feet bgs and 611-625 feet bgs. Results of the testing demonstrated that this well, known as Southwest Yelm Well 1A (SW Well 1A), is capable of yielding 2100 gpm on a consistent basis.

The cities of Lacey and Olympia both have applications for water rights that will have effects in the Nisqually and Deschutes Basins, and Yelm has collaborated with these cities on impacts analysis and mitigation strategies through Interlocal Agreements. The unique regional mitigation package presented here provides for significant ecological benefits to water bodies in the Nisqually and Deschutes River basins. The combination of flow mitigation through retirement of existing water rights – combined with habitat acquisition and restoration projects in the Nisqually, Deschutes, and Woodland Creek areas -- present an overall benefit to these ecosystems.

[1] City of Yelm Water Rights Mitigation Plan. February 2011 Update.

Table 1 Application Summary

Attributes	Summary
Name	Yelm City
Priority Date	January 10, 1994
Instantaneous Quantity	2100 gpm (additive)
Annual Quantity	942 af/yr (additive)
Purpose of Use	Municipal
Period of Use	January 1 – December 31
Place of Use	Area served by the City of Yelm

Table 2 Proposed Sources of Withdrawal

Source Name	Parcel	WellTag	Twn	Rng	Sec	QQ Q	Latitude	Longitude
WELL	78640000024	ALM 113	17N	01E	23	SE SE	46.94524	-122.64347

Legal Requirements for Approval of Appropriation of Water

RCWs 90.03 and 90.44 authorize the appropriation of public water for beneficial use and describes the process for obtaining water rights. Laws governing the water right permitting process are contained in RCW 90.03.250 through 90.03.340 and RCW 90.44.050. In accordance with RCW 90.03.290, determinations must be made on the following four criteria in order for an application for water rights to be approved:

- Water must be available
- There must be no impairment of existing rights
- The water use must be beneficial
- The water use must not be detrimental to the public interest

This report serves as the written findings of fact concerning all things investigated regarding Water Right Application Number G2-29085.

Public Notice

RCW 90.03.280 requires that notice of a water right application be published once a week, for two consecutive weeks, in a newspaper of general circulation in the area where the water is to be stored, diverted and used. Public Notice was published two times in The Nisqually Valley News, a weekly news paper with a circulation of over 24,000 copies. The publications commenced on September 8, 1994 and ended on September 15, 1994. No protests were received.

Consultation with the Department of Fish and Wildlife

Ecology must give notice to the Washington State Department of Fish and Wildlife when processing applications to divert or store water (RCW 77.57.020). Ecology has consulted with the Washington State Department of Fish and Wildlife on this application.

State Environmental Policy Act (SEPA) Compliance

The City, as the SEPA authorizing agency, issued a Determination of Non-Significance on the proposal on April 11, 2011.

INVESTIGATION

In consideration of this application, Ecology reviewed available reports relating to the application's site conditions, available and projected water demand, the potential effect on existing water right holders in the immediate area, applicable mitigation plan(s) from the cities of Olympia/Nisqually Indian Tribe, Lacey and Yelm, the modeled impacts of pumping SW Well 1A will have to nearby basins, and established minimum in-stream flows. This included information submitted by the applicant, including well construction and testing reports, hydrogeological impacts analysis, proposed mitigation strategies and pertinent Ecology records and databases, including well logs and water right records. The review also included reports from multiple investigations characterizing the area hydrogeology, water quality of the Nisqually and Deschutes WRIAs, and documents relating to the watershed planning process.

In concert with this application from Yelm, the city of Lacey also submitted six new water right applications and the city of Olympia submitted three water right change applications. Coordination between the three cities included joint development of a regional groundwater model. The model was used to evaluate multiple scenarios, including individual and cumulative pumping impacts, as well as effectiveness of mitigation measures. Results of the modeling are the basis for development of mitigation actions, including those that are jointly proposed for Woodland Creek, Deschutes River (in WRIA 13), and McAllister Creek (in WRIA 11).

Using this information, Ecology evaluated water availability and potential effects of the proposed appropriation upon existing groundwater and surface water rights, including in-stream flows, and water quality. Each of the four requirements specified in RCW 90.03.290 were individually examined and the findings are presented below. In addition, Ecology has evaluated this application in the context of other applications filed by the cities of Lacey and Olympia that are being processed at this time. Accordingly, the following investigation focuses on this individual application, but also as appropriate considers and references Lacey's and Olympia's applications.

The regional groundwater model represents the best available science for analyzing the effects of groundwater pumping and making water rights decisions for large water right requests within the model's boundaries. However, for many of the water bodies evaluated, the predicted effects are very small relative to measured stream flows and/or the groundwater inflow to each water body. Furthermore, the conservative construction of the McAllister model potentially leads to over-prediction of depletions along the model boundaries, which includes the Deschutes River and Nisqually River.

Project Description

Yelm, through Application for a Water Right number G2-29085, seeks authorization to withdraw groundwater from the well known as SW Well 1A for the approved area to be served by the City of Yelm.

The water authorized under this permit will service the long-term needs of the City of Yelm. Yelm's current water right portfolio includes 894.92 af in primary water rights from 11 certificates (see Table 2). The quantity requested in Application G2-29085 is based on the estimated water demands of the City - for a 20 year period, consistent with the City's Water System Plan.

The place of use for this application is the water service area consistent with the current City of Yelm Water System Plan. The current water system plan was approved by the Washington State Department of Health on December 1, 2010.

Site Description

The proposed point of withdrawal is located in the southeast quarter of the southeast quarter of Section 23 in Township 17 North, Range 1 East (of the) Willamette Meridian. SW Well 1A is located in the Tahoma Terra area, about 7000 feet due west of downtown Yelm and approximately 1800 feet due west of Thompson Creek, which is a tributary of the Nisqually River (WRIA 11).

The SW Well 1A was completed in October 2010 to a depth of 633 feet bgs with a 12-inch diameter casing from +2 feet to 367.5 feet bgs and an 8-inch diameter casing and well screen assembly from 349 to 633 feet bgs. The well is located at approximately 381 feet above the National Geodetic Vertical Datum of 1929) (ft NGVD29). Static water level is approximately 102.5 feet bgs (278.5 feet elevation above mean sea level). The screen design capacity of this well is 2,700 gpm and the recommended pumping rate is 2,100 gpm.

Hydrologic/Hydrogeologic

Assessment

The Yelm area is situated in the southern portion of the Puget Sound Lowland, a north-south oriented basin that has evidence of repeated deposition, erosion and reworking of glacial and non-glacially derived sediments during glacial and interglacial periods.

The most recent glacial advance and retreat into the Yelm area occurred approximately 13,500 to 15,000 years ago and is known as the Vashon Stade of the Frasier Glaciation.

Extensive geologic studies and investigations of Thurston County and the Yelm area were conducted by Mundorff et al. (1955), Wallace and Molenaar (1961), Drost et al. (1998), Drost et al. (1999), and Robinson and Noble (2001).

The hydrogeologic units known to exist within this area of Thurston County from the surface downward include the following:

- Recessional Outwash (Qvr)
- Till (Qvt)
- Advance Outwash (Qva)
- Kitsap Formation (Qf)
- Salmon Springs Drift (Qc)
- Unconsolidated and undifferentiated deposits (TQu), and
- Bedrock (Tb)

The primary water-bearing units include the Qva, Qc, and TQu units. The Qvt (till) and Qf (Kitsap Formation) units are typically composed of low-permeability, fine-grained sediments and acts as confining layers.

A brief description of each unit follows[2]:

Recessional Outwash (Qvr)

Recessional outwash deposits (Qvr) cover most of the Yelm area east of the Thurston Highlands residential development. Qvr sediments were deposited by meltwater streams discharging from the most recent glacier as it retreated northward from the Yelm area. Qvr deposited sediments are the youngest geological deposits in Yelm area (with the exception of alluvial sands and gravels found in local streambeds).

Qvr sediments are composed primarily of sand and gravel. Wells logs for the area indicate a thickness to range between 10-50 feet thick. In the Yelm area, the Qvr is generally too thin to support water supply wells in the Yelm area.

Till (Qvt)

Underlying the Qvr is the Qvt or till layer. The Qvt is a mixture of compacted clays and silts, with unsorted sands, gravels, cobbles and boulders that was picked up and transported by the glacier as it advanced into the area and was deposited over the Qva. Drillers often also refer these deposits as "hardpan". The Qvt deposits confines the groundwater in the deeper Qva layer.

The Qvt unit is found at depth throughout the Yelm area and is exposed at the surface west of Yelm, forming the eastern portion of the Thurston Highlands area. The thickness of the Qvt generally ranges from 35 to 80 feet, and is known to exceed 100 feet in areas west and southwest of Yelm (Drost et al. 1999). The Qvt unit is considered a confining layer and its cemented conditions limit its water transmitting capacity.

[2] The City of Yelm Southwest Well 1A Development Report. March 15, 2011. Golder Associates.

Advance Outwash (Qva)

The advance outwash deposits (Qva) lie beneath and are confined by the overlying Qvt till. The Qva sediments were carried and deposited by meltwater streams discharging from the glacier as it advance southward over the Yelm area during the most recent glaciation. The Qva is a permeable aquifer unit and consists generally of gravel in a matrix of sand with some sand lenses. The Qva is widespread throughout the subsurface ranging in thickness between 15 – 85 feet, and is the primary source for domestic and municipal water supplies in the Yelm area.

Kitsap Formation (Qf)

The Kitsap Formation (Qf) is a low-permeability, fine-grained confining layer that separates the overlying Qva unit from the deeper Qc and TQu units. The Qf unit is composed of predominantly clay and silt, with some local layers of sand and gravel, and may include some till or till-like deposits and minor amounts of peat and wood. The Qf unit is extensive throughout the Yelm area and ranges in thickness between 25 to 80 feet.

Salmon Springs Drift (Qc)

The Salmon Springs Drift lies beneath the Kitsap Formation. This unit consists of primarily coarse-grained sand and gravel and is generally characterized by oxidized red or brown staining (iron-oxides). This unit is referred to as the Salmon Springs Drift by Noble and Wallace (1966) because the stratigraphic relationships mapped in the Thurston County area are similar to the Salmons Springs Drift type-section mapped in Pierce County. The Qc unit is extensive throughout the Yelm area and ranges in thickness from between 15 – 50 feet. Groundwater in the Qc unit is confined by the overlying Qf unit.

Unconsolidated and undifferentiated deposits (TQu)

Underneath the Qc unit is a layering of unconsolidated and undifferentiated deposits known as the TQu Unit. This unit consists of glacial and non-glacial sediments of clay, silt sand and gravel and is known to consist of layers of fine-grained confining beds and coarse-grained aquifer units (Drost et al., 1999). The TQu unit is widespread throughout the region, but its thickness and groundwater capacity are not very well known. The TQu is the target aquifer for SW Well 1A.

Bedrock (Tb)

The deepest hydrogeologic unit in the Yelm area is the consolidated bedrock, identified as the Tb Unit. This bedrock unit consists of sedimentary claystone, siltstone and sandstone and igneous bodies of andesite and basalt. The Tb unit is known to contain some water in fractures and joints, but is considered to be an unreliable source of water due to low yields and poor water quality (Drost et al., 1999).

Groundwater Flow

In the shallow Vashon aquifers (Qvr and Qva), groundwater flow directions generally correspond to surface topography – with groundwater divides located near ridgelines, and flow tending toward nearby creeks and river discharge points, and overall regional flow towards Puget Sound, about 11 miles NNW of SW Well 1A. Groundwater flow is also locally affected by increased leakage through discontinuities in the till (Qvt). The hydraulic effects of these discontinuities are apparent in observed groundwater elevation contours (Golder Associates, 2011) and in regional (Drost et al. 1999) and local groundwater modeling (Golder, 2008) studies, which were conducted to examine the effects of increased pumping as a result of Yelm's, Lacey's new water right applications and Olympia's change applications.

Groundwater flow in the intermediate Qc aquifer exhibits similar flow patterns as the overlying Vashon aquifers, but the effect of local surface water drainages is less. Drost et al. (1999) concluded that deeper groundwater discharges principally to regional discharge features like the Nisqually River system and Puget Sound. However, similar to the Vashon aquifers, groundwater divides in the Qc aquifer are near topographic ridgelines, with flow directions toward the regional discharge features described above. An analogous flow pattern is observed in the deeper Qc/TQu aquifer.

The SW Well 1A is completed in the TQu aquifer. Testing of the well following completion indicate an average transmissivity of about 48,000 gpd/ft[3]. Storativity was estimated to be 0.0002, which is consistent with typical confined aquifer coefficients[4].

Other Rights Appurtenant to the Place of Use

Yelm's current water right portfolio includes 894.92 af in primary water rights from over 11 certificates (see Table 2). The quantity of 942 af requested in Application G2-29085 is based on the estimated demand for a 20 year period within the area served by the City of Yelm water system.

Table 2 – City of Yelm's Water Right Portfolio.

Source	Water Right Number	Priority Date	Qi in gpm	Qa in afy
Wells 1A and 2	SWC 4980	4/10/50	157*	54.44
Wells 1A and 2	GWC 597	5/24/50	500	145
Wells 1A and 2	GWC 1581	4/9/51	250*	62.22
Wells 1A and 2	GWC 3561	7/21/58	700	112*
Wells 1A and 2	G2-22969C	7/12/74	140	63
Wells 1A and 2	G2-24778	11/30/77	100*	39
Wells 1A and 2	G2-26041	12/7/81	500	356
Ferguson Wells	CG2-GWC5721	10/16/07	80	14.2*
Ferguson Wells	CG2-GWC5155	10/16/07	380	77

[3] The City of Yelm Southwest Well 1A Development Report. March 15, 2011. Golder Associates.

[4] The City of Yelm Southwest Well 1A Development Report. March 15, 2011. Golder Associates.

Wells 1A and 2	CG2-GWC597	3/8/10		31.26
Wells 1A and 2	McMonigle Transfer		50	67
TOTALs			2350	894.92

*Value is Non-Additive

Water Resource Inventory Area 13

WRIA 13 includes the Deschutes River watershed and several other smaller watersheds, including the Eld, Budd, and Henderson Inlets. The Henderson Inlet watershed contains two major streams – Woodard and Woodland Creek – in addition to a half dozen smaller drainages that emanate from coastal valleys sloping toward Puget Sound. The headwaters of Woodland Creek begin on the Hawks Prairie upland, with a chain of lakes (Hicks, Pattison, and Longs Lakes) and interconnected wetlands. Below the headwaters, Woodland Creek is typically ephemeral, but a large spring just north of Martin Way provides perennial baseflow to the creek. In addition, several tributaries joining Woodland Creek below the springs also contribute to summer baseflow.

Due to the nature of the shallow soils and the generally flat topography of the upper Woodland Creek basin, it is estimated that a majority (80 to 90 percent) of the infiltrated precipitation either discharges directly to Puget Sound or across the WRIA 11 boundary to McAllister Creek and the Nisqually River system (Clingman 2001).

The WRIA 13 watershed planning process was to *"create a long-range water resource management framework to protect aquatic habitat and provide water for vital community needs."* The key challenge for the watershed planning group, consisting of governmental, tribal, and private entities, was to balance the water needs of a growing region with the imperative to preserve adequate stream flows (WRIA 13 2004b).

Although the WRIA 13 Watershed Plan was not finalized or officially adopted by the Planning Unit, several recommendations were made, based on the additional data collected during the planning process, regarding how to best implement the three major planning elements – Water Quantity, Water Quality, and Instream Habitat. The availability and appropriation of public water was a central theme to all elements considered.

Minimum Instream Flows – WRIA 13

Chapter 173-513 WAC outlines an instream resources protection program and specifies minimum instream flows for the Deschutes River Basin and WRIA 13. The program effectively limits, and in some cases prohibits, the further issuance of consumptive water rights that could affect flows. The Chapter 173-513 WAC also stipulates that lakes and ponds in WRIA 13 are to be "retained substantially in their natural condition while considering future allocations."

The Chapter 173-513 WAC specifies the Deschutes River, from river mile 41 to the confluence with Capitol Lake, is subject to instream flows and seasonally closed April 15 to November 1. In addition, Woodland Creek and all its tributaries, including Long, Pattison, and Hicks Lake, are closed to further

consumptive appropriations, year round. This implies that no consumptive water is available following adoption of Chapter 173-513 WAC (June 24, 1980), unless it is verified that such appropriation would not adversely impact the neighboring closed water body.

Water Resource Inventory Area 11

WRIA 11 is divided into seven sub-basins. The sub-basins represent surface drainage areas of significant tributaries to the Nisqually River. However, sub-basin delineation, similar to the boundaries of the WRIA, often do not correspond with groundwater divides or aquifer boundaries – such as the administrative delineation between the Yelm and Thompson Creek upland of WRIA 11 and the McAllister Creek sub-basin of WRIA 11.

The Nisqually Tribe and the WRIA 11 Planning Unit completed a Watershed Management Plan in October 2003. The main objective of the plan is to *"develop a comprehensive strategy for balancing competing demands for water, while at the same time preserving and enhancing the future integrity of the watershed."* The scope of the plan was focused on examining and presenting recommendations on five key issues: growth and land use, groundwater resources and supply, water rights, in-stream flow and surface/groundwater continuity, and water quality.

The WRIA 11 plan presented several recommendations for processing water rights within WRIA 11. The recommendations include batch processing of water right applications by sub-basin, along with filling identified data gaps prior to processing. The plan also offers 16 possible mitigation strategies for consideration in processing water rights.

Minimum In-stream Flows WRIA 11

Similar to the WRIA 13 instream flow rule described above, Chapter 173-511 WAC outlines an instream resources protection program and specifies minimum instream flows for the Nisqually River Basin and WRIA 11.

Most applicable to Yelm's application are the year-round closure of McAllister Creek and all its tributaries (except Medicine Creek) and Lake Saint Clair. In addition, Chapter 173-511 WAC divides the mainstem Nisqually River into four stream management units (SMU): lower, bypass, middle, and upper reaches. Chapter 173-511 WAC specifies control points (stream gages) for each of the four mainstem SMUs, and specifies minimum instream flows for all months of the year at each control point. The control point for the Lower Reach is located at river mile 4.3, which represents the reach between the influence of the mean annual high tide (at low flow conditions) and the outlet of the Centralia City Light Power Plant (river mile 12.6). In addition, the bypass and middle reaches of the mainstem Nisqually River are closed to further consumptive appropriation from June 1 to October 15.

Flows in the Nisqually River are controlled by the Tacoma Power operated LaGrande Dam and the Centralia City Light operated river diversion near Yelm. These projects are regulated by the Federal Energy Regulatory Commission (FERC) and are required to be operated at a level that ensures sufficient instream flow for fish in the Nisqually River.

In 2001, Ecology completed a study examining instream flows in the lower reach of the Nisqually River. As a surrogate for the control point at RM 4.3, a numerical relationship was developed predicting flows in the lower reach from two upstream USGS gages and the study-specific discharge measurements collected at RM 4.6. Comparison of the numerical relationship to historical data indicate that minimum instream flows in the lower reach have been met much of the time, except for only a couple known failures.

Predicted Impacts to In-stream Flows and Closures

Hydrogeologic impacts associated with this application were evaluated through joint-development of a regional groundwater model with all project stakeholders. Based on the original Thurston County groundwater model developed by the United States Geologic Survey (Drost et al. 1999), the groundwater model was originally developed for Olympia for evaluating impacts to surface water bodies near McAllister Springs and Olympia's proposed McAllister Wellfield (Golder 2008). This model was further refined by Olympia (Camp Dresser, McKee) in 2002 and then by Lacey and Yelm (Golder Associates) and by Olympia (S.S. Papadopulos & Associates) through 2010. Additionally, Olympia, Lacey and Yelm shared in the development and refinement of the same numerical groundwater model that was used to conduct evaluations of their proposed water right applications.

Modeled impacts due to increased pumping in the SW Yelm Tahoma Terra area were completed by Shannon & Wilson and are included in Appendix A of the Yelm Water Rights Mitigation Plan (February 2011).

The impacts of Yelm's appropriation, including maximum annual predicted depletions (in cfs) and cumulative annual impacts (in afy) are presented in Yelm's Water Right Mitigation Plan (2011 Update) and are summarized below:

Nisqually River Basin: 0.32 cfs and 197 afy
McAllister Creek Basin: 0.21 cfs and 119 afy
Deschutes River Basin: 0.24 cfs and 131 afy
Woodland Creek: 0.02 cfs and 15 afy

Cumulative regional impacts, including the proposed withdrawals for Olympia and Lacey are:

Nisqually River Basin: 6.47 cfs and 4625 afy
McAllister Creek Basin: +4.44 to 16.44 cfs and + 3215 to 11,903 afy
Deschutes River Basin: 0.7 cfs and 505 afy
Woodland Creek: 1.06 cfs and 631 afy

Yelm's Water Rights Mitigation Plan

To address the impacts to in-stream flows, the City of Yelm Water Right Mitigation Plan, February 2011 Update was developed by Yelm and submitted to Ecology for review. The plan is designed to mitigate for this water right application. As part of the development of its Mitigation Plan, Yelm developed collaborative mitigation strategies with the cities of Lacey and Olympia for the Deschutes and Woodland Creek Basins. Olympia's move off of McAllister Springs will also have a regional impact for the cities of

Lacey and Yelm and will contribute to the success of their mitigation plans. The plan utilizes both in-kind (direct replenishment of flow) and out-of-kind (riparian protection and habitat improvements).

A summary of mitigation actions proposed by Yelm (2011) by river basin and sub-basin is included in the sections below.

Based upon these modeled impacts, Yelm proposes to mitigate for these impacts in the following manner.

Nisqually River Basin
Yelm's predicted impact to the Nisqually River system is 0.32 cfs (197 af annually).

Pursuant to Chapter 173-511-030 WAC, the lower mainstem of the Nisqually River is open year-round to appropriation, subject to seasonal instream flows at river mile (RM) 4.3. At the present time, there is no flow gage at RM 4.3 for recording whether instream flows are met at this location. Flows in the Nisqually River are mainly controlled by the Tacoma Power operated Alder and LaGrande Dams and the Centralia City Light operated river diversion near Yelm. These projects are regulated by the Federal Energy Regulatory Commission (FERC) and are required to be operated at a level that ensures sufficient instream flow for fish in the Nisqually River. As noted in studies by both Ecology staff and Tacoma Public Utilities staff evaluating minimum flows on the Nisqually, excursions below the minimum flow are very rare. Since water in the lower reach of the Nisqually River is available for appropriation and since Yelm's predicted impacts are less than 1% of the baseline flow of the Nisqually River, Yelm will complete out-of-kind mitigation actions identified in the Mitigation Plan.

McAllister Creek Basin
Yelm's predicted impact at McAllister Creek is 0.21 cfs (119 af annually).

Regional mitigation in McAllister Creek will be provided by Olympia when Olympia transfers its water rights and current surface water withdrawal of up to 21,969 AFY from McAllister Springs to the new McAllister Wellfield. The McAllister Wellfield is located in Section 30, T18N, R1E WM, about one mile SSE of McAllister Springs.

When Olympia ceases diverting water from McAllister Springs and starts withdrawing water from the McAllister Wellfield, the flow in McAllister Creek is predicted to increase by up to 6.72 to 18.72 cfs, which will offset the predicted impacts from all three cities, including Yelm's predicted impact of 0.17 cfs.

Woodland Creek Basin
Yelm's predicted impact to Woodland Creek is 0.02 cfs (15 af annually).

Yelm's contribution to Lacey and Olympia's Woodland Creek mitigation program, as further described in Lacey and Olympia's reports of examination, will be out-of-kind participation in the acquisition of property and/or conservation easements along Woodland Creek to increase the amount of undeveloped protected land along the creek.

Deschutes River Basin

Yelm's predicted impact to the Deschutes River is 0.24 cfs (131 af annually).

Impacts to the Deschutes River Basin will be offset through joint regional mitigation measures, which will include both in-kind and out-of-kind methods. During the closer period (April 15-November 1), impacts will be partially mitigated through the acquisition and retirement of consumptive irrigation water rights.

Together, the three cities have purchased 270 af of certificated water rights from two separate irrigation certificates:

S2- 00972CWRIA (Dillard and Juanita Jenson): 100 afy and 0.50 cfs
G2-26862GWRIS (Ron Smith): 170 afy and 0.67 cfs

Out-of-kind mitigation is proposed to offset impacts during the non-irrigation season, including land acquisition and habitat restoration. This includes the joint-purchase of over 200 acres of the Smith Farm, located on the upper reach of the Deschutes River, with over a mile of river frontage. Following acquisition of the property, a number of riparian and habitat projects will be completed, including: river channel improvements, reestablishment of wetlands, installation of a cribwall to prevent erosion, and planting of several low- and high-density riparian buffers.

APPLICATION EVALUATION

This Report of Examination (ROE) evaluates the application based on the information presented above and listed in the References section at the end of this ROE. To approve the application, Ecology must determine that each of the following four requirements of has been satisfied:

(1) Beneficial Use: the water would be put to a beneficial use;
(2) Availability: water is physically and legally available;
(3) Impairment: the proposed appropriation would not impair existing water rights; and
(4) Public Interest: the proposed appropriation would not be detrimental to the public interest.

Water Availability and Impairment of Flows

In an approximately one-mile radius around the point of withdrawal for this application there are 22 Water Right Certificates, 6 Water Right Permits and 91 Water Right Claims. This number was determined by conducting a search of Ecology's Water Rights Database for Sections 13, 23, 24, 25, and 26 in T17N, R1E, WM. A vast majority of these water rights are for stock watering, irrigation and either multiple domestic or single domestic purposes. The largest certificated use in this area is for an annual withdrawal (Qa) of 150 acre-feet/year for the irrigation of 75 acres (G2-27096CWRIS). The well associated with this water right is located in the SE ¼ SE ¼ of Section 24, about one-mile due east of SW Well 1A, and is 95 feet deep and is screened in the Qva.

Based on the results of the October 2010 pump tests for SW Well 1A and since all of the existing wells within a one-mile radius of SW Well1A are screened in shallower aquifers, no impairment to these wells or to senior water rights will occur.

Thompson Creek, an intermittent stream which drains north to the Nisqually River, is located approximately 2000 feet east of SW Well 1A. The creek seasonally flows over a thin layer of permeable Qvr sediments throughout its entire length. Data sources and technical analyses submitted by the applicant indicate the creek is located above and is disconnected from the Qvr groundwater system throughout its intermediate and lower reaches by an unsaturated zone. Upstream, the discharge to Thompson Creek is precipitation dependent, and the creek becomes a losing stream during the drier months. Because the potential to lower shallow groundwater levels through deep system pumping is limited by observed stratigraphy and measured hydraulic response to pumping, and the creek is largely disconnected from shallow system hydrology, Thompson Creek is not likely to be impacted by pumping of nearby deep wells located in the Tqu Aquifer, including Yelm's.

Both Chapters 173-511 WAC (Nisqually Basin) and 173-513 WAC (Deschutes Basin) state the purpose of the rules is to retain perennial rivers and streams with instream flows and levels necessary to provide protection for wildlife, fish, scenic-aesthetic, environmental values, recreation, navigation, and water quality.

The rules close portions of the Nisqually and Deschutes Rivers and some other water bodies to further consumptive appropriations and establish specific instream flows on the rivers. Yelm has proposed to use water for municipal supply purposes in a manner that is predicted to deplete flows in both the Deschutes River and Nisqually River basins in periods when the rivers are closed or when they may not meet adopted instream flows.

Stream "closures" are determinations by Ecology under RCW 90.54.020 that water is not *available* for further appropriations. *See Postema v. PCHB*, 142 Wn.2d 68, 95, 11 P.2d 726 (2000). However, a stream closure may, in certain circumstances, be overridden under an exception that authorizes a new appropriation from a closed stream "in those situations where it is clear that overriding considerations of the public interest will be served." (RCW 90.54.020(3)(a). Similarly, under this statute an instream flow can be overridden if "overriding considerations of the public interests are served."

In making a statutory determination of overriding considerations of public interest under RCW 90.54.020(3)(a), the analysis applies three steps:

1. Determine whether and to what extent important public interests would be served by the proposed appropriation. The public interests served may include benefits to the community at large as well as benefits to the river or other environmental resources;
2. Determine whether and to what extent the proposed appropriation would harm any of the public interests (fish, wildlife, scenic, aesthetic, and other environmental and navigational values) protected by the closure and/or any other public interests; and
3. Determine whether the public interests served (as determined in Step 1) clearly override any harm (as determined in Step 2).

The following sections of this report present this three-step OCPI analysis.

Public Water Supply Benefits. When the total package of mitigation measures is considered, the Mitigation Plan proposed by Yelm results in net ecological benefits for water resources specifically and natural resources generally.

The substantial water quantity mitigation provided by acquisition of two water rights acquired (Smith and Jensen) benefits the key reaches of water bodies at critical times of the year. For example, water quantity mitigation benefits target the upper and middle reaches of the Deschutes River, whereas the majority of the impacts occur in the lower reach of the river. The few water depletions predicted by modeling occur in less critical areas and in the winter and shoulder seasons that are less critical to the ecological values protected by regulations. In addition, timing of mitigation measures are phased to match development of the water right such that mitigation will occur at the same time or before the corresponding impacts take place.

Regional coordination of water supply development and mitigation by sub-basin/s is a dominant theme in the Nisqually Watershed Management and Implementation Plans. The plans identify existing water right applications and identify priorities based on the level of information available for appropriate decision-making. These plans note that, "the lack of processing threatens the ability of municipal water providers to supply water for future growth." The Yelm and McAllister sub-basins are identified in the WRIA 11 Nisqually River Management Plan as Ecology's top priority for batch processing. The WRIA Planning Unit determined that there was adequate information available for Ecology to process the water rights applications within these sub-basins and also recommended specific mitigation strategies (Implementation Plan, recommendations WR-1 and WR-3, page 16; Watershed Plan, recommendation WR-3, pages 53-54).

Yelm's water rights would provide a significant source of public water supply addressing future needs of customers and business served by Yelm. Providing reliable public water supplies that meet the needs of population and economic growth is an important state policy recognized in RCW 90.54.010 and RCW 90.54.020. Yelm's forecast predicts that without the new appropriation Yelm would have an unmet need in excess of 942 afy by 2030. The new water supply would provide a measure of water security to Yelm.

McAllister Creek Benefits. While Yelm's water right proposal will result in impacts to McAllister Creek, the overall effect of the combined actions of the three cities will result in greater flows to McAllister Creek. This will provide substantial benefit to the continued restoration of the McAllister Creek Basin.

Deschutes River Benefits. The City of Yelm in collaboration with the Cities of Lacey and Olympia, are offsetting predicted flow depletions in the Deschutes River and significantly enhancing fish and wildlife habitat in the basin using two methods:

- Flow mitigation (in-kind) through acquisition and retirement of irrigation water rights, and;
- Land acquisition and habitat restoration (out-of-kind).

As part of a shared mitigation strategy, the cities of Olympia, Lacey and Yelm have purchased a farm (Smith Farm) along with its water right, and the water right from another farm (Jensen Farm), both of which are located in the Deschutes watershed. The cities would retire the water rights and conduct habitat improvement projects on the Smith Farm. The cities have acquired consumptive irrigation water rights that will mitigate predicted impacts by returning water to the river during most of the low-flow closure period. Both water rights total 270 acre feet of water during the irrigation season (May through September). The cities gave higher priority to the acquisition of surface water rights in the upper and middle reaches of the Deschutes River, to ensure that mitigation was in the same reach as, or upstream of, predicted impacts. For Yelm, this approach provides a considerable amount of additional benefit to the upper and middle reaches of the river.

In addition, the three cities have proposed an out-of-kind mitigation package for the non-irrigation period (October through April) impacts on the Deschutes. The proposed out-of-kind mitigation will result in numerous habitat improvements on the Smith Farm including habitat enhancements to over one mile of mainstem riparian habitat on the Deschutes River, as well as side channel and wetlands enhancements. The Cities propose land acquisition and habitat restoration as the most appropriate strategy for "winter" impacts. These actions can have greater biological benefits during the winter than flow mitigation. For example, in the Deschutes, one of the primary limiting factors for fish in the winter is the availability of off channel rearing habitat and/or large woody debris that provide protection from high main stream flows. In addition, these restoration actions will have year-round (high flow and low flow) benefits and basin wide improvements in water quality.

The Cities have jointly purchased over 200 acres of farmland which is located in the upper reach of the Deschutes River. This property is currently a sheep ranch and has been altered considerably from a natural condition. The property includes Deschutes River frontage, most of the frontage of the outlet channel from Lake Lawrence, and springs that flow via the outlet channel to the Deschutes River. To evaluate the Smith Ranch's potential for water rights mitigation, the cities contracted with Anchor QEA to conduct an acquisition and restoration assessment of the site. Anchor QEA concluded that this site is uniquely situated to provide habitat restoration benefits.

Ecology's October 2008 Draft TMDL report for the Deschutes River recommends riparian plantings, stream channel restoration, reduction of fine sediments, and elimination of animal wastes to reduce temperatures, improve dissolved oxygen levels, and reduce fecal coliform bacteria.

Woodland Creek Benefits. Yelm's predicted impact due to pumping of the new SW Yelm Well 1A is 15 AFY.

Yelm's predicted impacts are small and do not consistently exceed the accuracy limit of the model that indicates impacts are likely to occur. Yelm's contribution to Lacey and Olympia's Woodland Creek mitigation program, as further described in Lacey and Olympia's reports of examination, will be out-of-kind (financial) participation in land acquisition for riparian preservation. The predicted impacts associated with Yelm's pumping will occur only after Yelm's pumping at SW Well 1A increases substantially.

Analysis of Public Interests Potentially Harmed by the Proposal

Nisqually River Impacts. Yelm's withdrawal of water under this permit will deplete flows in the Nisqually River by up to 0.32 cfs (197 afy annually). The flow of the Nisqually River is controlled by releases at Alder Dam, and the releases are intended to ensure flows on the river are met and exceeded. Ecology's (2001) analysis indicates that on rare occurrences flows are not being met on the lower reach at RM 4.3. On these rare occasions, up to 0.32 cfs modeled depletion could occur when flows are not met on the river.

Thompson Creek Impacts. Thompson Creek, an intermittent stream which drains north to the Nisqually River, is located approximately 2000 feet east of SW Well 1A. The creek seasonally flows over a thin layer of permeable Qvr sediments throughout its entire length. Data sources and technical analyses submitted by the applicant indicate the creek is located above and is disconnected from the Qvr groundwater system throughout its intermediate and lower reaches by an unsaturated zone. Upstream, the discharge to Thompson Creek is precipitation dependent, and the creek becomes a losing stream during the drier months. Because the potential to lower shallow groundwater levels through deep system pumping is limited by observed stratigraphy and measured hydraulic response to pumping, and the creek is largely disconnected from shallow system hydrology, Thompson Creek is not likely to be impacted by pumping of nearby deep wells located in the Tqu Aquifer, including Yelm's.

Deschutes River Impacts. Yelm's withdrawal of water under this permit is predicted to result in depletion of flows in the Deschutes River, which are estimated to be approximately 0.09 cfs (65 acre-feet per year) during the non-irrigation period (October 1 through April) and a total of .24 cfs (131 afy) of year-round impact. Flows are not met approximately 25 to 30 % of time during this period. In addition to the instream flows, the Deschutes River is closed to further appropriation in October. Therefore a portion of the depletion will occur when flows are not met or the Deschutes River is closed to further appropriation. The impacts to the Deschutes River basin are not being fully mitigated in-kind.

Woodland Creek Impacts. Yelm's impacts to Woodland Creek are minimal and will largely be mitigated through Yelm's contribution to Lacey and Olympia's Woodland Creek mitigation program, as further described in Lacey and Olympia's reports of examination, with out-of-kind (financial) participation in land acquisition for riparian preservation.

Tri-Lakes Impacts. Yelm's impacts to the Tri-Lakes area are minimal and will largely be mitigated through Yelm's contribution to Lacey and Olympia's Woodland Creek mitigation program, as further described in Lacey and Olympia's reports of examination, with out-of-kind (financial) participation in land acquisition for riparian preservation.

Summary of OCPI Analysis

The conclusion of the OCPI analysis can only be reached by weighing the potential benefits and harms to the public interest. When all of the public interest benefits and harmed are compared, it becomes evident that the potential benefits clearly outweigh the potential harms. Although the Mitigation Plan provides in-kind mitigation in the form of purchased existing water rights, there are small depletions of the Deschutes River, Nisqually River, Tri-Lakes, and Woodland Creek that cannot be mitigated in-kind.

These small depletions are the only public interest potential harms that have been identified in this evaluation. The package of in-kind and out-of-kind mitigation offered by the three cities and the Nisqually Indian Tribe will result in net ecological benefit and provide significant public health, safety and welfare benefits.

Yelm (together with Olympia and Lacey) proposes in-kind mitigation that addresses the majority of surface water depletions. The water quantity mitigation provided by acquisition of water rights (Smith and Jensen), along with reclaimed water infiltration, benefits the key reaches of water bodies at critical times of the year. In addition, water quantity mitigation benefits target the upper and middle reaches of the Deschutes River, whereas the impacts are centered in the lower reach of the river.

Impacts to McAllister Creek will be mitigated in-kind by Olympia moving their surface water diversion to a wellfield which will increase flows to McAllister Creek.

Although there will be impacts to the flows in the lower reach of the Nisqually River, the river flows are controlled by the city of Tacoma as required under its FERC license. Therefore, these mandated flows result in the Nisqually River rarely falling below the established instream flows.

The out-of-kind mitigation will improve environmental conditions in both the Woodland Creek and Deschutes watersheds. This includes mainstem, side channel, and wetland habitat enhancements in the Deschutes to benefit fishery and water quality and habitat protections in Woodland Creek to benefit fishery and water quality. The few unmitigated impacts to flow on the Deschutes River are during the closure period and are minor relative to the habitat, water quality, and flow enhancement benefits of the out-of-kind habitat restoration.

Impacts to the Tri-Lakes are small. Unmitigated impacts to Woodland Creek occur during the wetter season and will be compensated through out-of-kind mitigation by the purchase of land and riparian habitat in the watershed.

In summary, the public interest benefits of the subject water right application requested by Yelm, the three change applications requested by Olympia, and the six water right applications requested by Lacey, override any public interest detriments associated with the subject application and with the three cities' new water supply and change or source projects.

Impairment Considerations to Other Groundwater Rights

In October 2010, Yelm's contractor Golder Associates conducted step rate and constant rate pump tests on SW Well 1A. SW Well 1A is screened in the TQu (Deep) Aquifer, is completed to a depth of 633 feet below ground surface (bgs) and is screened with three 35-slot screens located in water bearing zones of 369-437 feet bgs, 487-547 feet bgs and 611-625 feet bgs. This well withdraws water from a deep well-confined part of the TQu aquifer system. The aquifer testing conducted in October 2010 showed no observable response in the nearby wells that were used as observation wells during the pump tests. A total of 10 observation wells were used, including 4 exploratory wells previously installed by Yelm. All 4 of these exploratory wells were previously installed in the TQu Aquifer. Based on the confined nature of

the TQu Aquifer and the 327 foot seal depth of SW Well 1A, no significant hydraulic response in the overlying units was observed.

There are 6 existing water right permits, and 22 Certificates and 91 Claims within an approximate one-mile radius of the proposed point of withdrawal. Based upon the pump test conclusions, the fact that there were no observable declines in the network of observation wells used during the pump test and the fact that this application will withdraw water from a deep, confined aquifer, impairment of wells completed on the TQu, Qc, and Qva is not expected to occur.

Beneficial Use

In accordance with RCW 90.54.020(1), this application for municipal use represents a beneficial use of water.

Waters withdrawn from the deep (TQu) aquifer will supply additional water to Yelm. The water will be used at rates consistent with established municipal demand in western Washington, including all standards required in the Department of Health's Water Use Efficiency Program. Specific information about how this water is delivered and managed in Yelm's water service area is presented in the City of Yelm's Water System Plan, July, 2010.

The use of water for municipal purposes is defined in statute as a beneficial use (RCW 90.54.020(1)).

Public Interest Considerations

The final test pertaining to the granting of a water right is the requirement that the appropriation not be detrimental to the public interest. The effects of the appropriation on the public interest are analyzed in the availability section above, where it was concluded that overriding consideration of public interest clearly support approving the application.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend that this request for a water right be approved in the amounts and within the limitations listed below and subject to the provisions listed above.

Purpose of Use and Authorized Quantities

The amount of water recommended is a maximum limit and the water user may only use that amount of water within the specified limit that is reasonable and beneficial:

2100 gpm
942 acre-feet per year
Municipal supply

Point of Withdrawal

SE¼, SE¼, Section 23, Township 17 North, Range 1 E, W.M.

Place of Use

As described on Page 1 of this Report of Examination.

Michael J. Gallagher October 21, 2011

Michael J. Gallagher, LHG *Date*

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